Input: A single RGB-D image

Missing depth

Refraction of light
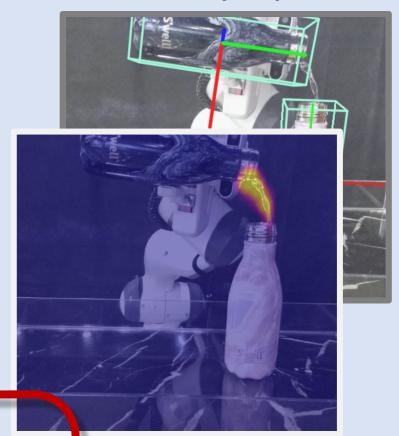
2D liquid perception & 6-DoF object pose

6-DoF object pose & 3D object size

3D liquid modeling

3D point cloud
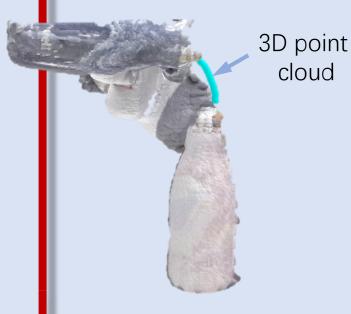
Open-loop with only bottle-to-bottle distance

Prev. method

Closed-loop with Liquid-to-bottle distance

Ours

Robotics Manipulation